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MARKET TRENDS AND RECENT DEVELOPMENTS IN MARKETING OF NATURAL RUBBER

Study by the UNCTAD secretariat

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I. INTRODUCTION

1. This report gives a brief review of trends and salient features of supply and demand for natural rubber over the years 1981 to 1991, the latest year for which complete data are available. Some aspects of recent developments in pricing of natural rubber, its processing and marketing are also discussed.

2. Natural rubber exports are a considerable source of income for the producing countries. Total world exports reached a value of $US 5.0 billion in 1988 but declined in 1991 to $US 3.4 billion, mostly because of a fall in prices. Earnings on natural rubber of the three major countries exporting it, Indonesia, Malaysia and Thailand, were respectively 3.3, 2.8 and 3.4 per cent of their total merchandise trade in 1991. For the smaller exporting countries, Côte d'Ivoire, Nigeria, Sri Lanka and Viet Nam, the shares were respectively, 1.9, 0.4, 3.2 and 2.7 per cent.

II. TRENDS IN MARKETS FOR NATURAL RUBBER

A. Global balances and prices

3. As seen in Table 1, world production of natural rubber exceeded world consumption in the years 1981 to 1984. While estimated stock at the world level increased, it was the buffer stock purchased by the International Natural Rubber Organization (INRO) in accordance with its price stabilization operations which picked up the surplus of production over consumption. Commercial stocks, or non-INRO stock, actually declined from 1981 to 1983 but edged up in 1984 although to a level less than that in 1981.

4. A reversal occurred in 1985 when world consumption exceeded production. The shortfall was met out of commercial stock but INRO stock increased as buying took place to support price in the latter part of the year.

5. The balance shifted again in 1986 and 1987 as world production exceeded consumption in each year. World stocks increased as commercial stocks rose and some of INRO's stock was sold at the end of 1987 when prices suddenly and unexpectedly shot up to levels where INRO was allowed to sell.

6. As a result of factors affecting both supply and demand, the situation changed again in the years from 1988 to 1990 as world consumption was larger than production in each year. The bulk of INRO's stock was sold in 1988 as part of the Organization's price stabilization activities and the remaining part was sold in 1989. As INRO sold stock in 1988, commercial stocks increased greatly. Commercial stock increased again in 1989 but fell in 1990, as INRO bought.

7. Again a shift occurred in 1991 as world production far exceeded consumption. The massive surplus was absorbed by a sharp increase in commercial stocks and some buffer stock purchased by INRO.

8. For the first nine months of 1992, world production continued to exceed consumption. INRO purchases were made in the months of August to October 1992.

9. World production, consumption, total stock, INRO stock and the INRO Daily Market Indicator Price (DMIP) are illustrated in Chart 1. Despite the seemingly small differences between production and consumption and the resulting small differences in world stocks, the price fluctuated in swings. It is thought that low short-term price elasticities of supply and demand contribute to such price movements.

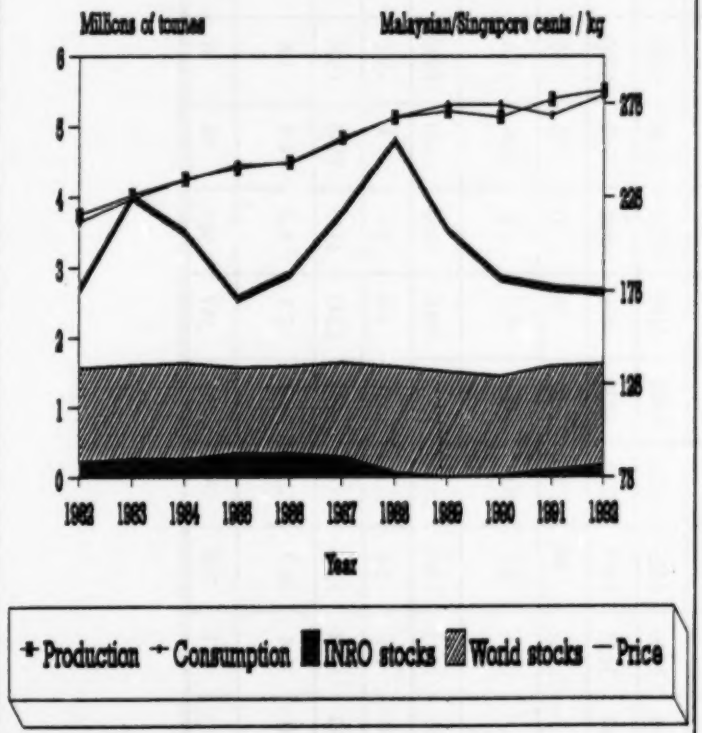
10. It is significant that INRO's price stabilization operations were successful in keeping prices from breaching the Lower Trigger Action Price or "floor" price and in defending the Upper Trigger Action Price or "ceiling", as illustrated in Chart 2. The price broke through the ceiling, however, in 1988 when the buffer stock was exhausted.

TABLE 1: NATURAL RUBBER SUPPLY/DEMAND BALANCE, 1981-1991
(1000 tonnes)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Average 1981-91	Annual average change (1981-91) per cent/year
World Production	3705	3750	4025	4255	4400	4490	4850	5130	5240	5200	5330	4580	3.1
World Consumption	3700	3655	3995	4230	4420	4460	4800	5160	5290	5240	5150	4555	3.0
Supply/Demand Balance	5	95	30	25	-20	30	50	-30	-50	-40	180	25	
Surplus/Deficit as % of Production	0.1	2.5	0.7	0.6	-0.5	0.7	1.0	-0.6	-1.0	-0.8	3.4	0.5	0.6
Estimated Stocks	1440	1535	1565	1590	1570	1600	1650	1620	1570	1530	1710	1580	
Per Cent Change in stocks	0.0	6.6	2.0	1.6	-1.3	1.9	3.1	-1.8	-3.1	-2.5	11.8		1.7
Commercial Stocks	1439	1304	1295	1321	1213	1243	1345	1546	1570	1496	1659	1403	
Per Cent Change in commercial stocks	0	-9.4	-0.7	2.0	-8.2	2.5	8.2	14.9	1.6	-4.7	10.9		1.6
INRO Buffer Stocks in store	1	231	270	269	357	357	305	74	0	34	51	177	

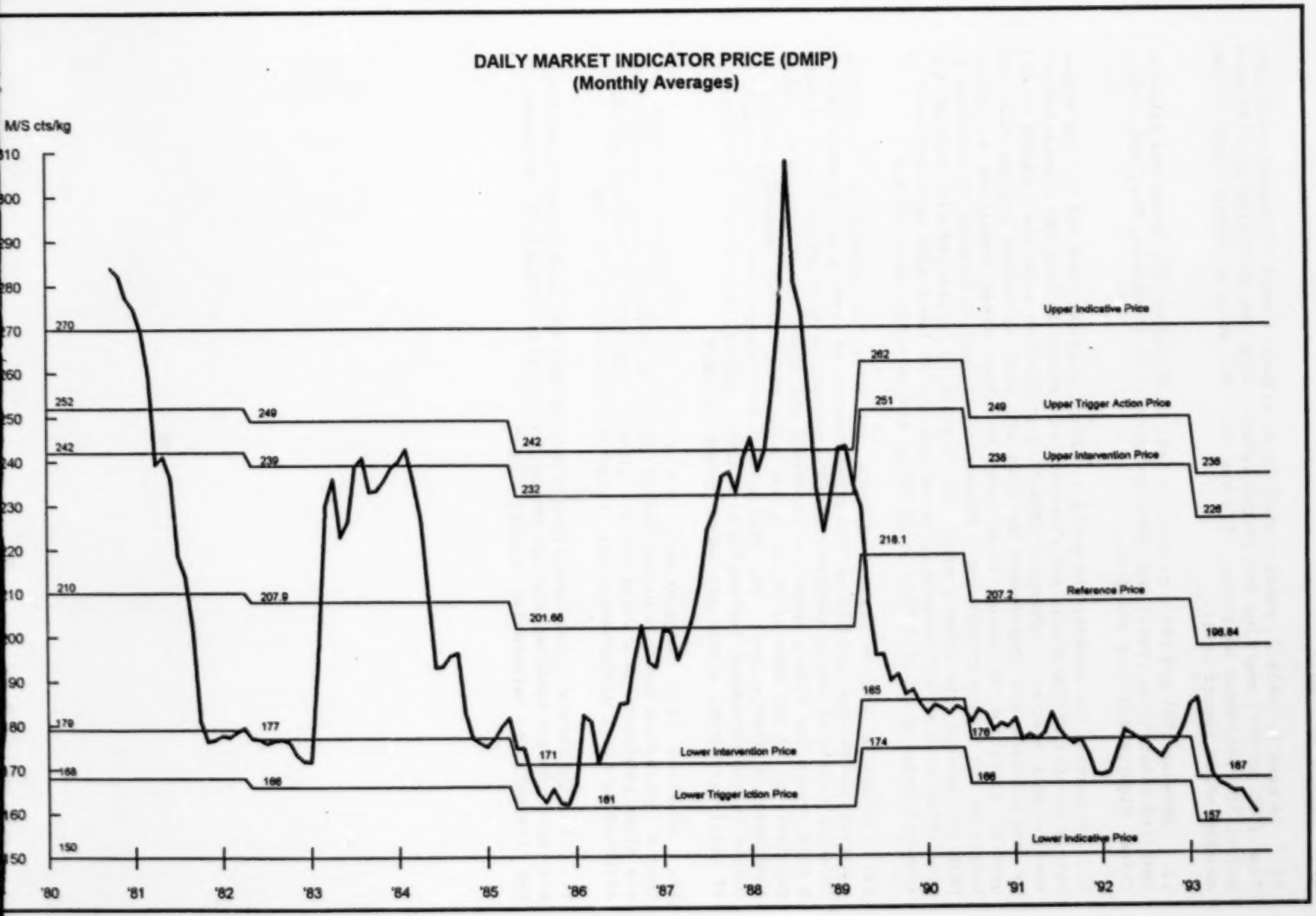
Source: INRO

CHART 1
WORLD PRODUCTION, CONSUMPTION, STOCKS AND PRICES OF NATURAL RUBBER, 1982-1992



Source: International Rubber Study Study Group (IRSG), Rubber Statistical Bulletin.
Stocks refer to those reported at the end of the year.

DAILY MARKET INDICATOR PRICE (DMIP)
(Monthly Averages)



B. Trends in supply

11. As seen in Table 2, world production of natural rubber increased every year from 1981 to 1991 reaching new record levels, with the exception of 1990 when production decreased slightly. Figures for 1992 show an annual rate at yet another world record level.

12. Between 1981 and 1991, production fell in Malaysia, Sri Lanka and Liberia, remained constant in Brazil and increased greatly in Indonesia, Thailand, India, China, Nigeria and Côte d'Ivoire.

13. Malaysia, for decades the world's leading producer, has had falling output mainly because of low prices and unattractive returns in both the plantation and smallholders sectors. Adversely affecting production were low tapping levels by smallholders and abandonment by some who took up better paying jobs and general migration of labour from rural to urban areas resulting in labour shortages for rubber production. Conversion of land to housing or planting in palm oil reduced area under rubber. An increase in replanting also reduced the productive area as old trees still producing but at low yields were replaced by immature trees which will only yield after six to eight years of age.

14. Indonesia and Thailand had huge increases in production. Despite unattractive prices, production increased sharply as trees planted years before in anticipation of better returns came into production in actual difficult times. A main reason for rising output in Indonesia was expansion of area under rubber cultivation, 83 per cent of which is now under smallholders ownership while the remainder is plantations. For Thailand, a main reason for strong growth in output is its successful replanting with high yielding trees as well as expansion of cultivated area, almost all owned by smallholders.

15. Starting from comparatively low levels of production, Nigeria and Côte d'Ivoire have had high proportionate increases in production, although they are minor producers on a world scale. Liberia's production has been seriously affected by civil disturbances but it had strong growth up to 1988.

16. All the natural rubber exporting countries have had loss of export earnings and their growers have experienced severe difficulties because of low prices in the international markets for natural rubber.

TABLE 2. PRODUCTION OF NATURAL RUBBER, 1981 - 1991

(1000 tonnes)

COUNTRIES	1981		1982		1983		1984		1985		1986		1987		1988		1989		1990		1991	
Malaysia	1510	(41)	1494	(40)	1564	(39)	1531	(36)	1470	(33)	1539	(34)	1579	(33)	1662	(32)	1415	(27)	1292	(25)	1253	(24)
Indonesia	868	(23)	880	(23)	997	(25)	1116	(26)	1130	(26)	1049	(23)	1203	(25)	1235	(24)	1256	(24)	1262	(24)	1337	(25)
Thailand	504	(14)	552	(15)	587	(15)	629	(15)	726	(17)	786	(18)	926	(19)	979	(19)	1179	(22)	1271	(24)	1341	(25)
Sri Lanka	124	(3)	126	(3)	140	(3)	142	(3)	138	(3)	138	(3)	122	(3)	122	(2)	111	(2)	113	(2)	104	(2)
India	151	(4)	166	(4)	168	(4)	184	(4)	198	(5)	219	(5)	227	(5)	255	(5)	289	(6)	324	(6)	360	(7)
China	128	(3)	153	(4)	172	(4)	189	(4)	188	(4)	210	(5)	238	(5)	240	(5)	243	(5)	264	(5)	269	(5)
Liberia	72	(2)	68	(2)	77	(2)	86	(2)	84	(2)	89	(2)	93	(2)	108	(2)	106	(2)	40	(1)	19	(0)
Nigeria	49	(1)	47	(1)	50	(1)	51	(1)	52	(1)	37	(1)	55	(1)	81	(2)	118	(2)	152	(3)	153	(3)
Côte d'Iviore	24	(1)	27	(1)	31	(1)	36	(1)	41	(1)	49	(1)	55	(1)	61	(1)	67	(1)	69	(1)	71	(1)
Brazil	30	(1)	33	(1)	35	(1)	36	(1)	40	(1)	33	(1)	27	(1)	33	(1)	31	(1)	30	(1)	30	(1)
World Total	3700		3750		4025		4255		4400		4490		4850		5130		5240		5200		5330	
Annual Change	-150		+50		+275		+230		+145		+90		+360		+280		+110		-40		+130	

Source: INRO

Notes: 1. World total refers to total production of all countries, including those not listed above.

2. Figures in parentheses refer to percentages of world production

C. Trends in demand

17. As seen in Table 3, the trend in consumption of natural rubber has been upward over the years 1981 to 1991. The trend of synthetic rubber consumption has also been rising but started from a much higher level in 1981 than did consumption of natural rubber. Natural rubber accounted for 33.2 per cent of the total consumption on average over the period. Its market share, however, increased from 30.2 per cent in 1981 to 35.7 per cent in 1991. Expansion of production of radial tyres was an important factor in the increase in natural rubber's market share, since radial tyres require a larger proportion of natural rubber than other kinds of tyres.

18. Consumption trends of the EEC, major countries and the CIS are seen in Chart 3. While the general trends are upward for all but the CIS, a serious decrease in levels of the EEC and the United States occurred in 1989 and 1990 due to recession in their economies. That of the CIS reached a new low in 1991.

19. Domestic consumption of natural rubber in the three major producing countries, Indonesia, Malaysia and Thailand, grew at a rapid rate although still a small part of off-take of their production or as a per cent of world natural rubber consumption. It is significant from a development perspective that these countries are pursuing further processing of their commodity rather than relying on exports of the raw material. Also, their domestic consumption of natural rubber for manufacturing now represents about 8 per cent of world consumption whereas in 1981 it accounted for only 4 per cent of total natural rubber consumption.

20. Apart from domestic consumption in the producing countries, all natural rubber enters into international trade before it is utilized in manufacturing of tyres and other rubber products. There is no domestic production of natural rubber in developed countries as it is a tropical crop. Trends in natural rubber imports and exports therefore generally follow consumption of the EEC, CIS and major importing countries.

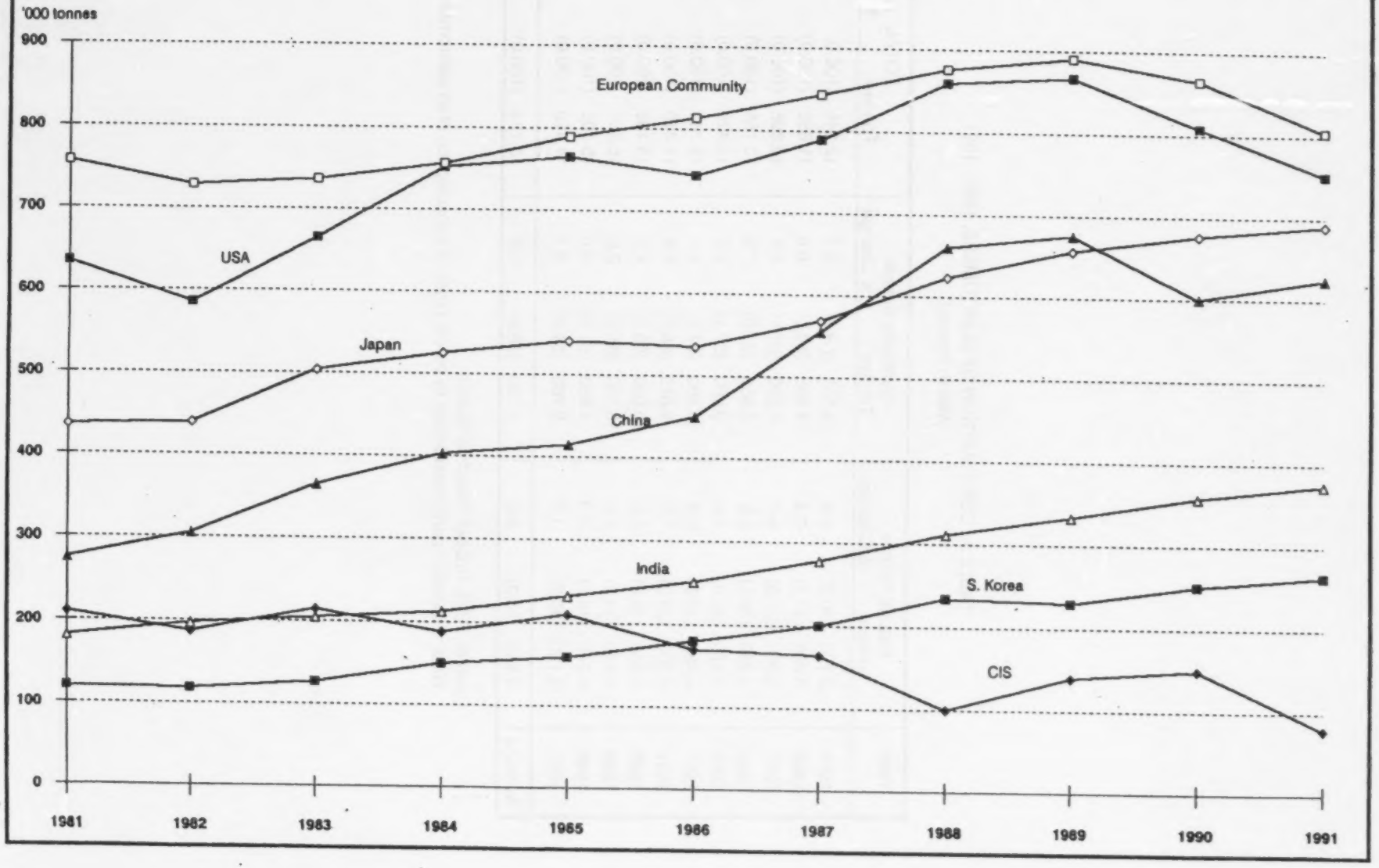
21. The main destinations of Indonesia's rubber and percentage shares for each are: the United States (44), the EEC (12) and, for transshipment, Singapore (22). Malaysia's major destinations are: the EEC (27), the Republic of Korea (14) and the United States (11). Thailand mainly exported to Japan (39), China (15) and the EEC (11). A large number of other countries accounted for remaining markets.

TABLE 3 : CONSUMPTION OF ELASTOMERS, 1981 - 1991
(Million tonnes)

Year	Natural Rubber			Synthetic Rubber			TOTAL		
	Tonnes		% Change	Tonnes		% Change	Tonnes		% Change
1981	3.700	(30.2)	-1.6	8.545	(69.8)	-2.7	12.245	(100.0)	-2.4
1982	3.665	(31.5)	-0.9	7.985	(68.5)	-6.6	11.650	(100.0)	-4.9
1983	3.995	(32.5)	9.0	8.300	(67.5)	3.9	12.295	(100.0)	5.5
1984	4.230	(32.1)	5.9	8.955	(67.9)	7.9	13.185	(100.0)	7.2
1985	4.420	(32.9)	4.5	9.000	(67.1)	0.5	13.420	(100.0)	1.8
1986	4.460	(32.5)	0.9	9.280	(67.5)	3.1	13.740	(100.0)	2.4
1987	4.800	(33.3)	7.6	9.610	(66.7)	3.6	14.410	(100.0)	4.9
1988	5.160	(34.0)	7.5	10.000	(66.0)	4.1	15.160	(100.0)	5.2
1989	5.290	(34.5)	2.5	10.060	(65.5)	0.6	15.350	(100.0)	1.3
1990	5.240	(34.7)	-0.9	9.860	(65.3)	-2.0	15.100	(100.0)	-1.6
1991	5.150	(35.7)	-1.7	9.260	(64.3)	-6.1	14.410	(100.0)	-4.6
Average	4.555	(33.2)	3.0	9.169	(66.8)	0.6	13.724	(100.0)	1.3

Source: IRSG, Rubber Statistical Bulletin.
Note: Figures in parentheses refer to percentages of consumption of all elastomers

Chart 3: NATURAL RUBBER CONSUMPTION



III. PRICE FORMATION IN INTERNATIONAL MARKETS FOR NATURAL RUBBER

22. A decade or more ago, price formation in international trade in natural rubber was guided by a global network of organized markets which was cohesive and integrated. Market developments and price movements were well disseminated and the pricing mechanisms were generally thought to reflect the state of supply and demand, although the markets were subject to some currency and other speculative interests unrelated to rubber. Since that time, the volume of trade and the numbers of participants in the organized markets have fallen while the volume of trade carried out directly between producers and consumers has risen. Concerns have been expressed as to whether the organized markets are functioning adequately in price formation, not only for setting the prices for natural rubber traded in these markets but also to guide the price discovery for direct trade between producers and consumers.

23. The following sections give a brief review of the organized markets, the main factors cited for the decline in trade and numbers of participants on these markets in the 1980s and early 1990s and some recent developments on strengthening these markets and their role in price formation.

A. Review of organized markets and price formation

24. Organized markets for natural rubber have traditionally been comprised of a series of primary and terminal markets with some of them servicing participants in the broader international trade. Primary markets largely provide services for transfer of ownership, payment, storage and transport from producers and sellers to the ports of shipment whereas terminal markets or distributive markets cover comparable services from the ports of discharge to consumer factories. The characterization of "terminal" has no relation to the delivery date of a contract. As for other commodities, standard contracts for future delivery traded on organized exchanges for hedging or speculative purposes are called futures and the markets for them are referred to as futures markets or the paper market. Physicals trading on organized markets refers to bilateral contracting between producers, exporters, dealers or brokers, on one hand, or dealers and consumers on the other. The organized markets all have official bodies to ensure orderly conduct of trade through enforcement and observance of their rules and bye-laws.

1. Singapore

25. Traditionally, Singapore has been an important international market for natural rubber for dealers and purchasing agents operating on behalf of major rubber manufacturers. Its success is attributable not only to its geographic location in the centre of the region producing most of the world's natural rubber but also to modern and efficient port, banking and other services. Some of the long-established large dealers and packers/millers have expanded their activities to neighbouring producing countries and thus achieved a level of integration in marketing.

26. Since the 1920s, Singapore has had leading futures and physicals markets in terms of turnover and influence in price formation. Prior to the 1980s, it was known for participation of local big speculators who bought and sold rubber

futures purely in the hope of making financial gains. The role of the Singapore physicals and futures markets in price determination has continued while other markets have declined in importance.

27. The Singapore market worked in the past through a core of brokers who maintained telephone contacts with the region's dealers, whether they were loose dealers, smokehouse owners, packers, exporters, importers or other dealers trading with them. The brokers gave bid and offer prices for the internationally traded RSS1 grade of natural rubber, a high quality ribbed smoked sheet (RSS) which, however, represented only a small part of the trade. The official prices in Singapore were compiled by a panel of price givers drawn from the membership of the Rubber Association of Singapore (RAS) who advised the secretariat of the RAS about what they believed the prices should be just before noon each day. An appropriate range of prices was chosen and announced by the media at 12 noon each day. These prices were used for a number of transactions by producers and traders. The price discovery mechanism was thought to work well, although it appeared secretive and was not transparent.

28. On 27 May 1992, the Rubber Association of Singapore Commodity Exchange (RASCE) opened with trading in futures for RSS1 sheets denominated in Singapore dollars and two mass tyre grades, RSS3 in US dollars and TSR 20 in Singapore dollars. Technically specified rubber (TSR) is preprocessed rubber ready for industrial use. Trading at the RASCE is based on a screen trading system called the Network Execution and Transfer (NEAT) system, which acts as the central clearing house for information and trading data. Brokers continued their past practice of giving offer and bid prices but are now called market-makers and post their bids/offers on their NEAT terminals. This information is immediately posted to other participants in an effort to assure price transparency and equal access to the futures market by all market participants regardless of where they are geographically. Also disseminated for each contract and month or quarter are information on the last traded price, the day's high and low prices, the previous day's settlement price, the current day's traded volume and the current open interest.

29. The RASCE started with seven market-makers including three Japanese houses, (Okato Shoji Singapore, Kanetsu Singapore and Yutaka Shoji Singapore) and four local firms (Dexin Commodities Singapore, Transworld Rubber, Bee Rubber Co., and Phillip Trading). In addition, it had 13 clearing members and 58 non-clearing members. The average daily turnover volume to the end of 1992 was about 7,000 tonnes, a level above the pre-opening forecast of 6,000 tonnes per day. However, of the three contracts, the volume was highest for RSS1 and lowest for RSS3.

2. Kuala Lumpur

30. Kuala Lumpur has long been an important organized primary market starting with the Malaysian Rubber Exchange (MRE) and later the Kuala Lumpur Commodity Exchange. Agency houses handled large quantities of rubber produced by estates, the bulk of which was later sold on the London market. The packers and millers were the main outlets for small estates and smallholdings which represented two-thirds of Malaysia's production. The packers/millers purchased from middle dealers and their offer prices were derived from prevailing prices in overseas markets. Also participating in the Kuala Lumpur market were local branch offices or subsidiaries of foreign commodity trading companies as well as brokers. Close traditional links between Kuala Lumpur and Singapore resulted in interrelated

activities and ownership of trading companies. Where once there was active trading in futures in Kuala Lumpur, there has been none since July 1989 because of insufficient interest in trading them.

3. London

31. The London market, in existence since the turn of the century was, as of the late 1970s, still a leading terminal market and centre for international trade, and it had an active futures market for trade hedging and speculation. Physicals trading was carried out by dealers who bought rubber from the producing countries and resold it to smaller dealers and consuming factories all over Europe. Some brokers in London specialized in this trade while others were engaged solely in futures trade. Some large Malaysian producers maintained offices in London to sell to dealers and consumers. Trade was carried out under the rules of the Rubber Trade Association of London (RTAL). The futures market was operated by the London Rubber Terminal Market Association (LRTMA). Future trading in London ceased in the mid-1980s because of insufficient volume of trading.

4. New York

32. New York has traditionally been an important terminal market for the United States. Physicals trading in New York was carried out under the rules of the Rubber Trade Association of New York. Dealers secured their supplies from other dealers and producers in primary markets. The New York Commodity Exchange (COMEX) had futures trading in rubber for many years but suspended it in 1970 due to lack of trade interest. In 1974, COMEX tried to revive trading in rubber futures but had to abandon it again in 1975. The New York Coffee, Sugar & Cocoa Exchange also tried to initiate trading in rubber futures in 1975 but it too ceased activity because of a poor response. New York dealers were said to hedge their positions in London and Singapore.

5. Tokyo and Kobe

33. Tokyo and Kobe have been traditional terminal markets for Japan's rubber manufacturers, importers and speculators. The Tokyo Commodity Exchange and the Kobe Rubber Exchange both have trade in rubber futures for RSS3. Participants are mainly Japanese interests. Arbitrage takes place with the RASCE in Singapore which also has trading in futures for RSS3.

B. Factors contributing to decrease in trading on organized markets

34. The following subject areas give an overview of some factors which have contributed to decrease in trading in physicals and futures. Extensive discussions of price discovery for natural rubber have taken place over the years in the International Rubber Study Group (IRSG) as a special subject in addition to the Group's regular functions of providing statistical information and assessing the market situation and outlook for rubber.

1. Absence of price volatility

35. Absence of price volatility, in the sense of short-term price fluctuations which would attract futures transactions for speculative or hedging purposes, has been cited as a factor which has led to decline in trading on the futures

markets in the 1980s. This assertion may seem surprising in view of the very sharp and large price rises and falls which took place in the 1980s, as seen in Chart 2. However, without the benefit of hindsight, perceptions were that the market prices would continue at low levels with minor fluctuations. Market participants generally did not perceive prospects for sharp upward movements in prices and when they did occur they were unexpected. Moreover, in the rapidly rising price trend from mid-1987 to mid-1988, much natural rubber had already been committed in direct contracts between producers and consumers and the market intermediaries could not perform their balancing role.

36. On the other hand, the large and sharp downward movements in prices were seen as returning to the general situation of ample supplies, low prices and small price fluctuations, hence of little speculative or hedging interest.

2. INRO's price stabilization interventions in the organized physicals markets

37. The International Natural Rubber Organization (INRO), established under the International Natural Rubber Agreement, 1979 and its successor of 1987 has, at times, intervened with purchases and sales from its buffer stock in accordance with the price range and other provisions of the Agreements. In particular, purchases were made on the organized physicals markets from late 1981 to early 1983 and again in mid-1985 in successful operations to support prices. The entire buffer stock was sold during the high price period running from September 1987 to March 1989 in an effort to fill imbalances between production and consumption, and defend the upper limit of the price range.

38. The natural rubber market got off to a sluggish start in 1990 as sentiment was bearish on reports of slower economic growth and declining sales in the motor vehicle and tyre industries in many industrialized countries. Purchases were made for the buffer stock in the first quarter of 1990 to support prices. No further purchases were made until the second half of 1991. Purchases were again made in August through October 1992 to sustain prices.

39. In the above-mentioned periods of purchases and sales, the buffer stock had a direct and strong influence on world physicals prices and futures prices. However, in the intervening periods, prices fluctuated in response to market fundamentals and were at quite steady levels for long periods as well as perceived to remain around these levels.

40. There appears to be considerably divergent views between traders and economic analysts over the role of the buffer stock with regard to price formation. Traders have asserted that market participants seem to have exhibited a preference for certainty of prices at the buffer stock's price limits, since market prices have tended to cluster around either the lower part of the range or its upper part. Economic analysts hold that market fundamentals determined price levels and the broad swings in them while the buffer stock's only role in price formation was during those periods where interventions were made to keep market prices from going beyond the price range.

41. As regards the context in which trading takes place and the function of the buffer stock, the buffer stock is not designed to change the trend of prices in the middle no-intervention zone, nor is it designed to make market prices average out over a long period at the reference point or mid-point of the price range.

42. The buffer stock's aim is to keep market prices from exceeding certain limits in the interests of producers and consumers. By comparison, futures are used in a market that allows prices to respond to fundamentals. They serve to transfer risks of adverse price movements from those not wanting to bear them to those who do so in the hope of making financial gains.

3. Growth of direct trade bypassing organized markets

43. Direct trade between producers and consumers that bypasses market intermediaries is often cited as the main reason for the drop in trading on the organized markets for natural rubber. Direct trade has grown considerably from little in the 1960s to an estimated 40 per cent of world trade in natural rubber in the mid-1980s and an estimated 60 to 70 per cent at present. The growth in direct trade may be seen as a manifestation of some basic factors discussed in the following sections as well as of closer integration and decision-making by a smaller number of buyers for tyre manufacturers which is discussed separately in Chapter IV on the globalization of rubber manufacturing. Other kinds of direct trade bypassing the organized markets are countertrade, barter and, in a general sense, growth of processing in the natural rubber producing countries since supply lines between growers and manufacturers are short.

44. Of the natural rubber producing countries, Malaysia and Indonesia are thought to be the largest users of direct trade. Much of this trading is done by large rubber manufacturing organizations and estates, factories producing technically specified rubber (TSR) or central processing facilities. An advantage of direct trade for producers is assurance of sales, especially when demand and prices are weak. Qualities traded are thought to be higher than average qualities in normal open trade and are concentrated on TSR20 and RSS3, the volume grades for making tyres. Average price contracts are written to supply at a price which is to be determined in relation to the Singapore benchmark prices in the period of one week to one month before delivery. A premium or discount in relation to the reference price is included. As quality traded is generally better than average quality in open trading, a premium is usually paid. Direct contracts on a fixed price basis or a combination of fixed and average price bases can also be made. Direct trade contracts of any type are usually for delivery in nearby months but may call for delivery of up to one year ahead. Direct trade contracts are sometimes referred to as long-term contracts, as they sometimes go beyond the 2 or 3 month period for delivery that is common in forward contracts for physicals.

4. Improved communications and shipping

45. Prior to the 1980s, dealers were an important link in communications of price and other market information, and in arranging the transportation of supplies of natural rubber. Trade associations in the organized markets published their official daily prices for physicals. These prices were determined by a committee in each association which generally represented brokers and dealers. The official prices were used as bases for subsequent negotiations

between contracting parties. There was thought to be a strong relation between futures prices and physicals prices, as the futures or "paper" market reflected market expectations.

46. As noted in paragraph 27, official prices in Singapore were announced daily at noon and broadcast and otherwise circulated in the region. These prices served as a basis for a large variety of contracts involving producers, as they were thought to be a fair reflection of the market despite their lack of transparency. But, the official noon prices reflected conditions only at that time. They were not real time prices in the sense of continuous and instantaneous communications.

47. Over time, communications have become instantaneous with mobile telephones and mobile fax machines. Producers and consumers can keep informed in order to easily deal in natural rubber without going through the organized markets and the intermediaries, including loose dealers and international dealers although the latter too now receive better market information.

48. Similarly, where shipping problems once were an obstacle to direct trade, facilities and services have improved and consumers need not go through the organized markets and intermediaries to acquire supplies on time. In two or three weeks, natural rubber can be shipped from the South-East Asian producing region to almost any industrialized country. Problems in shipping from African natural rubber producing countries still remain. These problems, together with uncertainty about qualities, have contributed to low export prices for natural rubber from the African countries.

5. More traded qualities and stricter quality specifications

49. Natural rubber was once traded only as sheets of various grades or ungraded. The introduction of preprocessed natural rubber ready to use in industrial applications as technically specified rubber (TSR) in the 1970s was a major innovation. Since then, the increasingly strict technical requirements of tyre manufacturers have led to direct contracting with suppliers to meet their special quality needs, thus bypassing the organized markets and intermediaries. Efforts are being made to make TSR from different sources interchangeable for a given grade, e.g. TSR20. It is unlikely that natural rubber will ever return to being a more homogeneous commodity by reducing the number of grades in view of the trend toward it becoming a more sophisticated industrial input. A comprehensive quality control system, such as the ISO 9000 guidelines, is needed to meet consumer requirements for quality. An idea has been mooted that natural rubber will become so heterogeneous and manufacturers requirements so specific that it will eventually be sold by highly specialized producers on the basis of list prices for sales to manufacturers, much as synthetic rubber manufacturers sell their rubber now.

6. Slow response of futures exchanges to changing needs of participants

50. During the 1980s, futures trading in Singapore declined and in London it stopped altogether. A reason cited for these results is that the futures exchanges did not keep up with changes that were taking place in the needs of buyers and sellers. An example is the slow response of the exchanges in introducing a TSR contract to complement the RSS contract, while for a long time TSR represented a considerable part of exports. Another example is the use of RSS1 in futures trading in Singapore while RSS3, which follows somewhat different

price movements, represented the bulk of trade in sheets. Thus, a hedging operation in RSS1 could increase risk of loss on trade in RSS3 as compared to an unhedged deal. A further example is the initiation of futures trading in Kuala Lumpur which involved a change in trading method from the whispering to the open cry system and a change in financial management that did not match the requirements perceived by the traders.

7. Low use of futures by producers and manufacturers

51. Futures markets have been used largely by dealers of various types. Producers and rubber manufactures have made relatively little use of futures despite well known arguments in favour of using them to "lock-in" attractive prices.

52. One reason cited for the low level of participation of producers is that most of them are smallholders and do not have the necessary volumes of production individually to engage in large enough operations to use futures. Large estates and parastatal organizations, notably in Malaysia, could use futures, if they chose to do so.

53. It is said that major tyre manufacturers have never participated in the futures market. One view is that they perceived the futures market to be lacking in sufficient volume of trade to reliably use futures. Another possible reason is that by buying regularly and in accordance with their needs they can arrive at an annual average purchase price that is close to the market average and this is a satisfactory result for their purposes. Manufacturers, in their purchasing strategies, are said to be mainly interested in maintaining competitiveness with each other in cost of purchases of natural rubber rather than whether natural rubber price levels are generally low or high. With the growth in interest in risk management stemming from currency and interest rate operations, use of futures is becoming a more easily accepted concept for rubber manufacturers.

C. Some recent developments concerning price formation

54. Trading in futures has received much more attention recently than has trading in physicals. As trading has fallen on the Singapore futures market, the only remaining important international exchange, much attention has been given to proposals on how to increase activity on the exchange as the last remaining futures market which could maintain a close relationship with physicals prices. Should it fail, market participants would have no other alternative than to trade through their own systems of contacts with companies, using official prices for physicals, a prospect seen with much anxiety by producers and consumers. The continuance of the Rubber Association of Singapore Commodity Exchange (RASCE) itself is not in question. It is the brokers and dealers who may not be able to continue, if their level of business declines.

1. Physicals prices

55. Official daily prices for physicals continue to be published by the respective rubber trade associations in the organized markets in Singapore, Kuala Lumpur, London, New York, Tokyo and Kobe. These official prices are used in subsequent negotiations between contracting parties. The Singapore award contract for TSR20 is one such official price and reportedly the reference price most widely used by producers. The Singapore RSS1 continues to be another, despite its small share in world trade.

56. Efforts are being made to make supplies from various sources interchangeable on, for example, TSR20 contracts in order to make trading more open and competitive. The growing number and strictness of quality specifications works against aggregation of grades. Heterogeneity of the commodity is, however, a needed feature of trade so as to provide manufacturers with qualities they need and producers with the premiums and discounts associated with them as incentives and disincentives to production. The trend toward more sophistication of qualities of natural rubber is irreversible, as noted in paragraph 49 above.

57. A problem in the present price determination for physicals is that official prices are generally based only on the supply/demand conditions seen by the representatives of the respective rubber trade associations, and not on a true global supply/demand perspective, including the huge amount of direct trade. The mechanism thus does not engender confidence of buyers and sellers. They look mainly to the Singapore market for guidance as the only remaining active international physicals and futures markets.

58. Proposals have been suggested for expanding trade through intermediaries and establishing price determination committees to cover as many participants and as much trade as possible. Pricing committees would consider expected levels of production and consumption as well as the current figures.

59. Better information on quantities and other aspects of direct trade would assist all participants in judging market conditions. This action would imply major institutional changes as the information on direct trade is now considered highly confidential by the parties involved and, even if devulged, ought to be subject to some verification.

2. Futures prices

60. Proponents of futures trading as an import element of price formation see a need to strengthen the relationship between the futures and the physicals markets on a global basis in a globalized market which would translate supply and demand conditions with as much transparency as possible into accurate and accepted world prices for natural rubber. In this way, the futures and physicals link should function as an accurate mechanism in guiding world prices for actual trade.

61. Proposals have been made to redirect more international trade through the intermediaries and, connected with them, appeals have been made to all market participants to make use of the Singapore futures market. While it would seem unrealistic to expect that trade could once again become almost wholly handled through intermediaries which would actively use futures, it may be possible to reactivate the Singapore market to a point where its volume and participation is sufficiently large that both buyers and sellers of physicals and futures place great confidence in it setting accurate world prices for natural rubber. It is noteworthy that other commodities, such as soyabeans, wheat, natural gas and crude oil, have been traded with a combination of open markets and direct trade.

62. Two broad steps have been taken to strengthen futures trading by increasing trading volume and participation. The first was to try to centralize in Singapore the remaining pockets of interest in futures in the world with the aim of revitalizing the Singapore exchange. The second is a plan to link trading in Singapore with trading in various other locations in the world.

63. For internationally linked futures markets, interchangeability of contracts or trading in the same contracts is an important feature. Common quotations of prices would be essential. Currencies and grades of futures contracts would have to be agreed but would be difficult to select to best meet the multiple interests of users of futures. Improving features of contracts would similarly be an intricate area but of vital importance to attract users.

64. The Association of Natural Rubber Producing Countries (ANRPC) has proposed linking of regional markets including Singapore's RASCE. Electronic linkage and setting up of futures markets in Thailand and Indonesia is now considered by the ANRPC to be superior to an earlier idea for a central market to which feeder markets would have channelled trade. Elements in the trading, clearing, guarantee and regulatory system are being studied. Initially, the RASCE would be linked to the Kuala Lumpur Commodity Exchange (KLCE) pending establishment of futures markets in Thailand and Indonesia which will take time.

65. For natural rubber, there has not been use of options or use of futures for protection or speculation by option writers. Options could possibly meet needs of producers, intermediaries and consumers, as well as being attractive to speculators. They could perhaps add to the volume of futures traded and numbers of participants in futures markets. It is noteworthy that, for other commodities, options have added to liquidity of futures markets and complemented futures rather than being competitors to them.

3. <u>The EFP mechanism as a means to link direct trade with the futures market and strengthen price formation</u>

66. The exchange for physicals (EFP) scheme of the Rubber Association of Singapore Commodity Exchange (RASCE) is reported to be attracting consumer interest.

67. Currently, direct contracts between producers and consumers require delivery of certain tonnages of rubber at prices that are determined in relation to the Singapore benchmark prices. The new EFP scheme of the RASCE allows producers to sell futures contracts and consumers to buy them with the possibility for the sellers and buyers to balance their trading at the end of each month with the physical delivery of rubber. The scheme was originally designed to get around the problem of low trading volumes on slow market days when prices are not favourable to producers or to consumers. The EFP scheme, however, has the capacity to internalize in price formation on the futures market the huge direct trade now representing an estimated 60 to 70 per cent of world trade in natural rubber, while preserving the advantages of direct trade.

68. If agreement could be reached between producers and consumers that all deliveries arising from contracts for direct trade will be effected through EFPs on a centralized futures market, a more accurate world price must emerge on the futures market since all changes in supply and demand forces would be reflected in the futures market.

69. A scheme outlining typical operations involving EFPs is seen in Chart 4.

70. As an example, Producer A has a direct contract to sell rubber for December delivery to Consumer B at a premium of 3 cents per kilo above the futures

exchange's benchmark price for RSS1. They execute the operations shown in Charts 5 and 6. The example is based on those given in an article by Quek Kar Tung, "How to overcome the effects of product differentiation and direct trading on price discovery and hedging", ANRPC News, September 1992. The results are:

- Producer A "locked in" a sales price at S$ 1.38 (i.e. S$ 1.35 plus 3 cents premium) on 4 May;

- Consumer B (who has a policy of not transacting in the outer months) pays S$ 1.13 which is 3 cents above the benchmark current month price as contracted;

- Producer A and Consumer B mutually arrange to off-set their futures contracts in an EFP and at the same time deliver rubber based on the contracted product and delivery specifications which are different from the exchange's specifications; and

- Most important of all, from the point of view of world price formation, changes in economic forces of demand and supply are reflected in the centralized futures market, thus influencing the benchmark price.

Chart 4

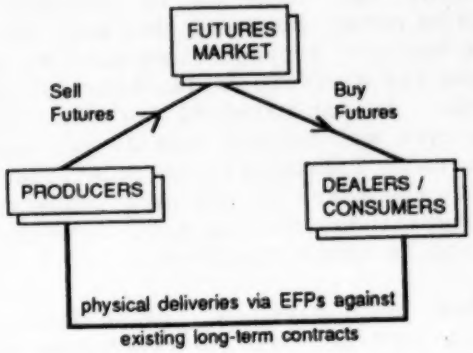


Chart 5

DIRECT CONTRACT AND EXCHANGE FOR PHYSICALS (EFP)

DATE	CONSUMER B			PRODUCER A		
	Cashflow		Action	Action	Cashflow	
	In	Out	Taken	Taken	In	Out
4 May				Producer A sells into futures market to "lock-in" price. Short December S$1.35*		
29 Nov			Consumer B buys futures. Long December at S$1.10			

*lock-in price

Chart 6

DIRECT CONTRACT AND EXCHANGE FOR PHYSICALS (EFP)

DATE	CONSUMER B			PRODUCER A		
	Cashflow		Action	Action	Cashflow	
	In	Out	Taken	Taken	In	Out
29 Nov			EFP at S$1.10 based on current price of S$1.10.		S$0.25	
2 Dec		S$1.13	Takes delivery and pays for deliveries at S$1.10 plus contractually agreed premium of 3 cents		S$1.13	
NET PAY-MENT		S$1.13		NET PRO-CEEDS	S$1.38	

*lock-in price plus agreed premium

IV. GLOBALIZATION OF WORLD TYRE MANUFACTURING

71. Rubber manufacturing has come to be closely identified with tyre manufactures. It should be noted, however, that much natural rubber is destined for production of a wide variety of other items such as conveyor belts, gaskets, footwear, hoses, covering for electric cable, bearings and engine mountings, to name only a few products. An estimated 60 per cent of global natural rubber consumption is used in tyre manufacture and 40 per cent for making non-tyre products. However, in main industrialized countries with their large tyre manufacturing industries, the share of the tyre industry is higher at about 75 per cent while the non-tyre industrial production accounts for 25 per cent of natural rubber consumption in these countries.

72. Much attention has been given to globalization of the world tyre manufacturing industry, a term by which is meant that the activities involved are increasingly carried out worldwide and that participants are increasingly inter-dependent. Extensive discussions on this subject have taken place in the International Rubber Study Group and in the International Natural Rubber Organization.

73. Globalization is a process of expansion of manufacturing companies through joint ventures, technical co-operation agreements between firms, voluntary mergers of existing companies, and acquisitions or takeovers of firms by others. The underlying reasons for these actions relate to technological, financial and marketing factors.

74. Technological advancement has been an important factor in globalization of the world tyre industry. The development of radial tyres, which have a much longer operating life than crossply or bias-ply tyres, is an example. As a result of their introduction and widespread use in the 1970s and 1980s together with a generally poor market for tyres, world manufacturing capacity had to be reduced as well as retooled for manufacture of radial tyres at enormous investment cost. These factors favoured the globalization process as the weaker companies were taken over or joined with the stronger ones in various ways. Substantial investments in R&D have been required to both meet the increasingly stringent technical specifications of the vehicle industry and to keep up with progress made by competing tyre manufacturing firms.

75. The world tyre industry is presently dominated by a small number of large companies centred in North America, Europe and Japan but with worldwide operations. Table 4 compares the value of tyre sales of the top ten companies in 1978 and 1989. The main movements of these large companies over the past ten years were that Bridgestone acquired Firestone; Uniroyal merged with Goodrich Tire to form Uniroyal-Goodrich Tire which in turn was acquired by Michelin; Sumitomo bought Dunlop which disengaged itself from Pirelli which in turn purchased Armstrong; and Continental acquired General Tire.

76. The ten companies seen in Table 4 accounted for 82.3 per cent of world tyre sales of US$ 47 billion in 1989. The position of the three largest companies, Bridgestone, Goodyear and Michelin, is particularly noteworthy.

77. For the producers of natural rubber, the consequences of globalization in the tyre industry are important. As noted in paragraphs 43 and 44, producers are now trading with highly specialized buyers for manufacturers through direct trade contracts. Moreover, the number of such buyers has decreased with the

consolidation that took place in the tyre industry. Another consequence is that natural rubber is becoming more and more of a high-tech industrial input in response to the increasingly stringent requirements of manufacturers. A third result is that globalization has brought with it an increase in tyre manufacturing in the natural rubber producing countries and more of their natural rubber is thus being consumed domestically.

TABLE 4: TYRE SALES BY MAJOR COMPANY

	1978			1989		
Ranking	Company	Country of Origin	Type Sales (US$ billion)	Company	Country Of Origin	Tyre Sales (US$ billion)
1.	Goodyear	USA	5.5	Bridgestone	Japan	8.5
2.	Michelin	France	4.2	Goodyear	USA	7.9
3.	Firestone	USA	3.4	Michelin	France	7.7
4.	Pirelli/ Dunlop*	Italy/UK	3.3	Continental	Germany	3.7
5.	*			Pirelli	Italy	3.0
6.	Bridgestone	Japan	1.8	Sumitomo	Japan	2.7
7.	General	USA	1.5	Uniroyal Goodrich**	USA	1.9
8.	Uniroyal	USA	1.2	Yokohama	Japan	1.7
9.	Goodrich	USA	1.0	Toyo	Japan	0.9
10.	Continental	Germany	0.7	Cooper	USA	0.7

* Pirelli and Dunlop had a technical/sales agreement but remained separate companies.

** Uniroyal Goodrich reported its sales as an independent company because Michelin's purchase was delayed to April/May 1990. The combined sales of Michelin/Uniroyal Goodrich total $9.6 billion compared to Bridgestone's $8.5 billion.

Source: INRO
IRSG
Rubber and Plastic News (20 August 1990).

V. RESEARCH AND DEVELOPMENT

78. Natural rubber is a commodity with a great potential for benefits from research and development in its production and use as an industrial input. Of special interest is scientific research on increasing yields of rubber trees and on improving the manufacturing and end-use characteristics of natural rubber.

79. In sixty years, the productivity of rubber trees has risen six-fold to over 3,000 kilos per hectare on experimental plots. Theoretical considerations suggest that the limit to yield lies somewhere around 9,000 kilos per hectare and annual yields of 7,000 kilos per hectare are considered achievable through highly sophisticated breeding techniques and under ideal growing conditions. These figures compare with average yields of 1,300 kilos per hectare on Malaysian estates and 936 kilos per hectare on Malaysian smallholdings in 1992, while yields in other producing countries were lower.

80. Another area for research and development is improving the characteristics of natural rubber in manufacturing processes and in end-use performance. Past gains in perfecting new forms of natural rubber such as technically specified rubber (TSR), thermoplastic rubber and epoxidized rubber demonstrate that important improvements can be made. Nearly half of natural rubber exports are now marketed in technically specified block forms. Another recent success is epoxidized natural rubber which is just starting to be commercially produced. It is chemically altered natural rubber which opens new markets for natural rubber in competition with some synthetic rubbers since it has good oil resistance and resistance to air permeability. The latter factor is important in uses such as inner tubes for tyres. Epoxidized natural rubber also has improved wet skid resistance, an important characteristics for tyre tread.

81. A wide range of R&D subjects are of importance to further processing and marketing of manufactured products containing natural rubber. These technical areas concern both the industrial processes themselves and the end-use performance of the manufactured products.

VI. INTERNATIONAL CO-OPERATION

82. International co-operation on natural rubber at the intergovernmental level has existed since 1944 when the International Rubber Study Group (IRSG) was founded. The activities of the Group then and to the present are: discussion of aspects of the world rubber industry including the production, marketing and distribution of synthetic and natural rubber and the consuming industries, publishing on a regular basis statistics of the world industry and conducting economic and statistical studies of subjects of particular importance to the industry. IRSG presently has 25 member countries. It also has a Panel of Associates comprised of 27 private sector companies and associations representing both natural and synthetic rubber sectors as well as the manufacturing sector.

83. The International Natural Rubber Organization (INRO) was established in 1980 under the International Natural Rubber Agreement, 1979 and continued under the International Natural Rubber Agreement, 1987. Price stabilization through the operation of a buffer stock, as discussed in Chapter II, has been INRO's primary purpose, although recently some projects on other measures have begun. The International Natural Rubber Council is currently considering renegotiation of the 1987 Agreement. The Agreement is due to expire on 28 December 1993, unless the Council decides to extend it for a period of up to two years.

84. Among producing countries, the Association of Natural Rubber Producing Countries (ANRPC), established in 1970 has brought together the main Asian producing countries. The activities of the ANRPC centre on conducting studies of the world rubber situation and problems facing the natural rubber sector, promoting research and development in production, marketing and consumption of natural rubber and co-operation with other international organizations.

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MARKET TRENDS AND COMMODITY DEVELOPMENT FOR COTTON

Study by the UNCTAD secretariat

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I. INTRODUCTION

1. This report gives a brief review of main trends in markets for cotton since the early 1980s and of recent developments in the areas of further processing of cotton, generic market promotion, research and development and price formation in world markets.

2. In a development context, cotton is important for income and employment provided in its production and processing in developing countries as well as for the foreign exchange earnings on its exports. An estimated 200 million people in developing countries gain all or part of their cash income from growing cotton. As a light industry which can utilize simple known technology, yarn and textile manufacturing has served as one of the first industries in the industrialization process. About 50 million people are employed in its processing in developing countries. The people growing and processing cotton represent about 7 per cent of the total population of all developing countries. Developing countries earned $US 3.5 billion on exports of raw cotton in 1990. Exports of cotton yarn totalled more than $US 2.7 billion for these countries in the same year. Cotton is grown for cash income in tropical and temperate regions in more than 85 countries, and is exported in significant quantities from more than a third of them. Most cotton producing countries are low to middle income developing countries. For 12 countries, raw cotton exports account for 15 per cent or more of their total export earnings and four countries, Benin, Burkina Faso, Chad and Mali, depend on raw cotton for over 40 per cent of their export earnings.

II. REVIEW OF MARKET TRENDS

A. Global trends

1. World production and consumption

3. World production and consumption of cotton have risen considerably in the 1981-1993 period as seen in Chart 1. Production fluctuated around the trend more than did consumption. Both production and consumption are expected to continue to increase in the years to come.

4. Five economies, China, the CIS, the United States, India and Pakistan, account for three fourths of world cotton production. The share of developing countries has increased during the past few decades due to a large increase in productivity. In the CIS, the largest cotton producing republic is Uzbekistan with almost two-thirds of CIS production. Turkmenia accounts for almost one fifth. The other large producers are Tadzhikistan and Azerbaijan.

5. A little more than one quarter of world production enters international trade as raw cotton exports, not counting trade within the CIS. The share would be much higher if cotton yarn and textiles were included in exports.

6. As regards consumption, China, India, the CIS and the United States account for over half of total cotton consumption at the level of mills that spin and weave it. Developed market economy countries account for somewhat over one fourth of raw cotton consumption by mills, but for close to one third of final consumption of cotton with yarns and textiles included.

2. World cotton trade

7. The major cotton producing economies also account for a large part of raw cotton exports. The CIS, the United States, Pakistan and China account for two thirds of projected exports for 1993. The levels of their exports over the period 1981 to 1993 are seen in Chart 2. The "other countries" group is mostly comprised of developing countries whose production is largely for exports and which rely on cotton for a major part of their total export earnings. Some cotton producing developing countries have expanded their exports of cotton yarn and textiles. The value of cotton yarn exports now exceeds that of raw cotton exports in Pakistan, Egypt, China and Brazil. The trend toward further processing of cotton is expected to continue as producing countries seek to gain the value added from this industry.

8. Imports of raw cotton are strongly concentrated. The EEC alone accounts for more than one fifth of cotton imports. Other important importers of raw cotton are Japan and the countries of East and South-East Asia in particular, Taiwan Province of China, the Republic of Korea, Indonesia, Hong Kong and Thailand. China started importing large quantities only in 1989.

3. Price developments

9. Chart 3 illustrates the movements in prices of three different kinds of cotton, CIF Northern Europe. The prices remained fairly stable through the 1960s to 1972. They shot up sharply with the "commodity boom" in 1973 and have fluctuated strongly since then. A sharp fall occurred in the period from 1980 to 1986, with some recovery since.

10. The price relation between the US Memphis territory M 1-3/32 inch and the very similar Central American M 1-3/32 inch seems to have widened and become more unstable. That of the quite different Sudan Barakat X4B, a fine long staple, moved differently from the other two.

11. Cotton yarn prices develop to some extent independently from raw cotton prices. In the United States, the price spread fluctuated between 80 and 120 cents per pound in the 1986-1992 period. In Japan, the spread fluctuated between 90 and 200 yen per pound in the same period.

12. Large production in the 1984/85 and 1985/86 crop seasons lead to oversupply, large stocks and low prices. A strong growth in consumption in 1986 and continued high consumption thereafter resulted in the limited price improvement, but prices have weakened since 1990.

13. World cotton prices are still at depressed levels. Strong concern was expressed about the depressed world prices for cotton at the 51st Plenary Meeting of the International Cotton Advisory Committee in October 1992. At that Meeting, a number of producing countries pointed out that the burden of adjustment falls heavily on producers, particularly in those countries with no or limited government support, and some developing countries highly dependent on cotton growing where growing conditions were unfavourable for alternative crops were facing economic and social disruption of crisis proportions.

Chart 1
World cotton consumption, production and exports

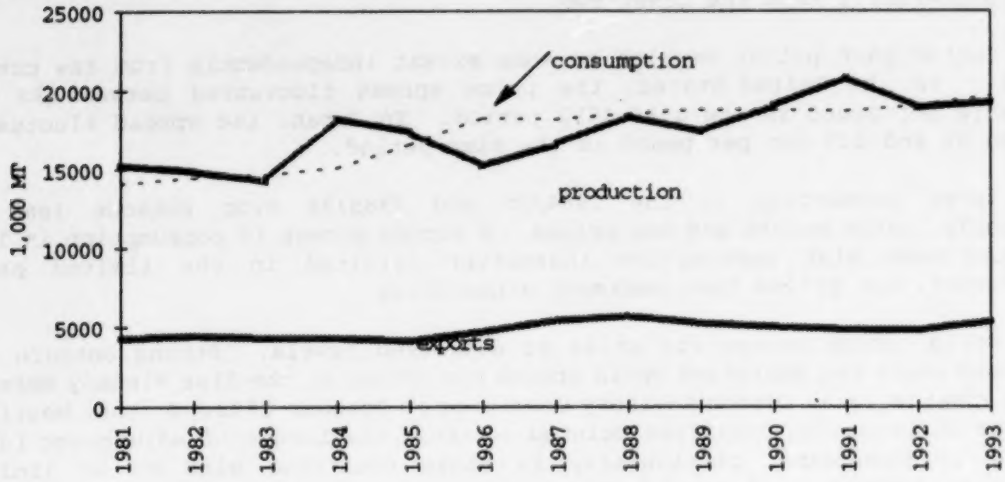


Chart 2
World cotton exports

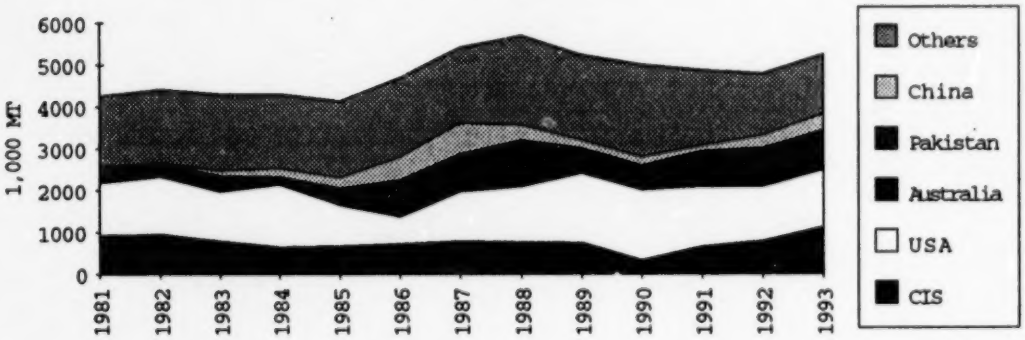
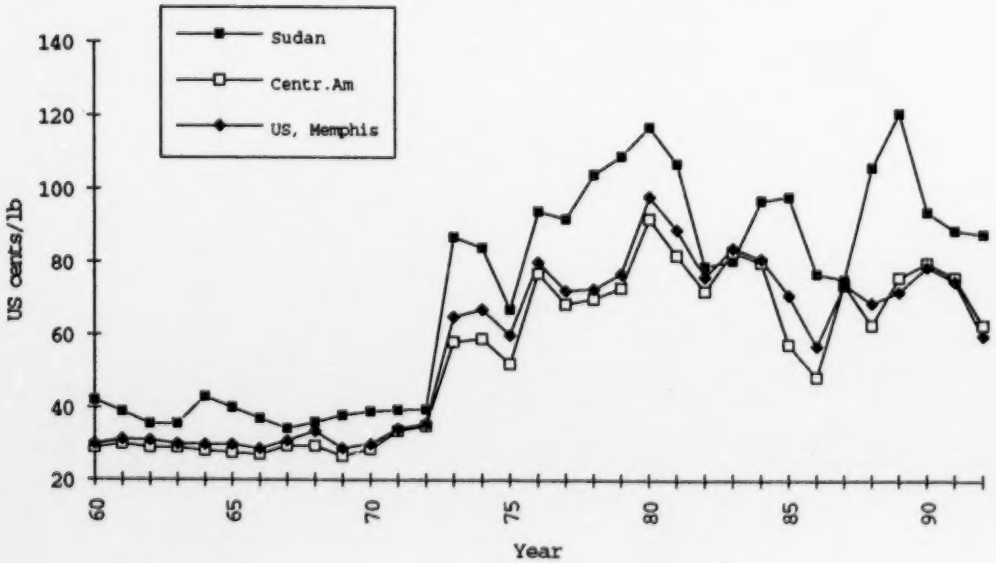


Chart 3
Cotton prices, CIF Europe, US cents/lb



B. Salient features of supply

14. World production of cotton increased from 14.1 million metric tonnes in the 1980/81 season (1 August to 31 July) to 18.4 million mt in 1992/93, as yields increased greatly while harvested area rose only slightly. Total exports of raw cotton paralleled the growth in production, rising from 4.3 million mt to 5.8 million mt in the period.

15. Africa's production edged upward from 1,152,000 mt to 1,262,000 mt in the period. However, a major shift occurred as Egypt's production dropped from nearly half of the continent's total to little more than one fourth while production increased in many small producing countries such as Benin, Burkina Faso, Côte d'Ivoire, Mali, Senegal, United Republic of Tanzania and Togo. Egypt's drop in production was due to a fall in harvested area while other producing countries had strong increases in yields and varying experiences with harvested area. Africa's exports rose from 565,000 mt in 1980/81 to 658,000 mt in 1992/93. A fall in Egypt's exports was outmatched by increases in those of the small producing countries which had rises in production.

16. Production and exports of raw cotton have dropped sharply in Mexico and the Central American countries. The levels which stood at 612,000 mt for production and 392,000 mt for exports in 1980/81 plunged to 63,000 mt and a mere 19,000 mt respectively in 1992/93.

17. South America's production increased slightly from 1,056,000 mt to 1,149,000 mt and exports from 205,000 mt to 270,000 mt in the 1980/81 to 1992/93 period. Some countries had increases in production and exports, notably Argentina and Paraguay, while others had decreases, particularly Colombia and Peru.

18. In the developing countries of Asia including Turkey but excluding China and the Central Asian republics of the CIS, production sharply increased from 2,861,000 mt to 4,850,000 mt in the period, mainly due to the huge increases of India and Pakistan but also some increases in a few other countries. India's rise was due solely to yield while Pakistan's was due to yield and, to a lesser extent, area. Exports of cotton from these developing countries of Asia jumped from 785,000 mt to 939,000 mt, as India, Pakistan and Syria increased their levels.

19. China had a tremendous increase in production in the period, rising from 2,707,000 mt in 1980/81 to 4,740,000 in 1992/93, due to large increases in both yield and area. Exports jumped from none to 200,000 mt.

20. Production in the CIS dropped from the level of 2,866,000 mt as the former Soviet Union to 2,079,000 mt over the 1980/81 to 1992/93 period, as yield fell and area did too but to a lesser extent. Exports to countries outside of the former Soviet Union, at 800,000 in 1992/93, are at the level of the 1980/81 season.

21. The United States had a huge increase in production from 2,422,000 mt in 1980/81 to 3,540,000 mt in 1992/93, due to a large increase in yield while harvested area fell. Exports rose from 1,290,000 mt to 1,372,000 mt.

22. Australia's production jumped from 99,000 mt to 325,000 mt in the period as both yield and area increased greatly. Exports followed with a sharp rise from 53,000 mt to 329,000 mt.

C. Salient features of demand

23. The evolution of demand for cotton has been favourable to the commodity over the past decade, despite strong competition from man-made fibres. Cotton has increased its market share to nearly one half of global fibre consumption and its consumption has risen steadily. Demand is expected to remain strong especially for high quality cotton.

24. The main factors explaining the positive performance of cotton are rising income levels, population growth and preferences of consumers.

25. The evolution of demand for cotton, on an end-use basis of final consumption, has differed from one region to another. Growth of consumption has been low in Eastern Europe as compared to the OECD countries. Also, cotton's share of all fibre consumption declined in the former while increasing in the latter.

26. Developing countries consume, on an end-use basis, about half of the world consumption. Consumption has been rising in these countries due largely to population growth. There are considerable differences in cotton's market shares among these countries. Shares of cotton are high in, for example, India and Pakistan compared to some other countries which have synthetic fibre production capacity and more vigorous competition.

27. The use of blends of synthetics and cotton differ from group to group. In developed countries, normal blends are typically 50/50 or 65/35 in favour of polyester. In developing countries blends are more rare and most fabrics are either all synthetic or all cotton.

28. Demand for cotton may be categorized into three general classes of end-uses: clothing, household uses and industrial uses.

29. Clothing is the main end-use. Cotton's market share in clothing has been increasing over the past two decades. More than half of total cotton consumption in industrialized countries is consumed as clothing even though the share of cotton in total fibre consumption is only about one third in the EEC and about 43 per cent in the United States. Clothing is a sector where fashion and subjective appeal as well as comfort, easy care and durability are important considerations for consumers.

30. Household uses is the next largest category in cotton consumption. Towels and bed linens are the largest end-uses as absorbency is a major factor and cotton's performance is good.

31. Cotton has not competed well in industrial uses, the smallest of the three categories of end-uses. Technical factors, such as abrasion resistance are important in industrial uses. Another factor is that the length of synthetic fibres can be adjusted to suit specific industrial requirements. In some applications, for example for automotive tyres, synthetics have completely replaced cotton.

32. Cotton's first competitors were the cellulostics, rayon and acetate. Since some of their characteristics were quite different from cotton, severe competition came only with the development of non-cellulostics, mainly polyester but also acrylic and nylon. Polyester met consumer preferences for easy care and abrasion resistance while presenting an appearance close to that of cotton. Blends of the two fibres have been used to obtain desirable qualities of both.

33. Competition with man-made fibres is not only a matter deriving from choices of final consumers. Decisions of spinners, within some limits, are also of importance in determining shares of cotton and the man-made fibres. Generally, for clothing a number of cost components for the final items, for example, design, distribution, and costs of brand names are higher than the cost of the fibres used. However, to a spinner or integrated spinning/weaving enterprise, the choice between fibres can be very sensitive to the fibres' prices since profit margins in spinning are very thin and the raw material constitutes a large part of total cost of manufacturing yarn. Operators will therefore try to minimize total manufacturing cost by choosing the combination of fibres that costs least yet still meets the specifications of contracts.

34. It has often been said that reliability of supply, stability of prices and good customer service are other factors favouring choice of man-made fibres by spinners. Another factor is that man-made fibres can be supplied in standard qualities while cotton, being a natural product, is subject to variations. It should be noted that in recent years grading of cotton has vastly improved with the introduction of high volume instrument (HVI) testing and scientific measurements to replace the more subjective visual techniques used by skilled personnel in the traditional grading systems.

35. Production of synthetic fibres is closely related to the petrochemical industry. Prices of synthetics depend not only on the price of crude oil but also on the pricing of the various petrochemical products where synthetics manufactures buy them or, in the case of integrated operations, the prices at which the transfer takes place. As petrochemicals have many other uses, their prices are not closely related to the demand conditions in the submarket for synthetics production.

36. The world recession has manifested itself in static consumption levels of cotton through the 1990-1992 period. Under normal economic conditions cotton consumption would rise from year to year. Some increase is expected in the 1993/94 season (1 August to 31 July) with an estimated 19.23 million metric tonnes as compared to 18.69 million metric tonnes in 1992/93. The rise is expected due to modest increases in consumption in a number of main countries with the notable exception of the CIS and Eastern Europe where the level is expected to remain unchanged, following sharp falls in 1990 and 1991.

III. FURTHER PROCESSING IN SELECTED DEVELOPING COUNTRIES

37. This chapter presents information on further processing of cotton and changes in trade regimes and policies for development of processing of cotton in five developing countries. They are Egypt, Mexico, Pakistan, Peru and Nigeria.

38. Although situations differ in these countries, they illustrate some new trends in world trade in raw cotton, cotton yarn and cotton fabric as well as imports into cotton producing/exporting countries of these products. These

countries show the greater complexity of the world trade matrix as compared to the simpler situation a decade or two ago of largely raw cotton exports by producing countries.

39. Of these five countries, Pakistan is the leading exporter with yarn slightly higher than raw cotton and fabric being less than either based on calculations by weight. By value, yarn and fabric would be higher than raw cotton in importance. Egypt, the next largest exporter of the three categories, has a heavy predominance in exports of cotton yarn and fabric, calculated by weight and even more so calculated by value. Egypt is also a large importer of raw cotton more than doubling its exports of raw cotton. According to the latest data available, Mexico has small exports of raw cotton and some exports of cotton yarn. Mexico's large imports of raw cotton taken together with cotton fabric imports are 13 times the volume of its raw cotton and yarn exports. Mexico also has large exports of ready-made clothing not counted in these calculations because of difficulty in estimating their weight. According to the most recent figures available, Peru's exports of raw cotton are only a third of its yarn and fabric exports taken together by weight. By value, yarn and cloth are of much greater importance. Peru imports as much raw cotton as it exports. Nigeria is a considerable importer of raw cotton with no exports or trade in yarn or cloth. Nigeria is of interest as a country with a large potential for cotton growing and processing.

40. All of the five countries have considerable cotton production with Pakistan's being the largest by far. Using latest figures available, exports of raw cotton, cotton yarn and cotton fabric net of imports of these categories are expressed as a per cent of production, giving a rough measure of the importance of trade as outlets for domestic cotton production or, in other words, the dependence of the production on trade for off-take. The percentage for Pakistan is highest at 69.8, Peru is next at 56.2. Egypt, with its large population and home market for apparel, has a percentage of 24.1. Nigeria's imports are the equivalent of a third of its domestic production of cotton. Mexico's cotton production has fallen so low that it is perhaps equivalent to only a fourth of its imports. As noted above, Mexico has large exports of clothing items that are not taken into account in these calculations.

1. Egypt

41. Cotton occupies a unique position in the Egyptian economy. As of 1985, it was the major source of cash income for about six million people including cotton farmers, farm workers and their families. In addition, the large spinning and textile industry is of importance for income and employment.

42. Egypt is a large producer of "Extra-Fine" cotton but exports only small quantities as the bulk of the crop is processed in the country. About 30 per cent of production is Extra Long Staple (ELS) having fibres 1-3/8 inches and above, and the remainder is Long Staple (LS) of 1-1/4 inches to less than 1-3/8ths. One-fifth of ELS production was exported in 1991/92 but only 3 per cent of LS output. Being Extra Fine cotton, Egypt's lint, yarn and textiles are of a special high quality. In marketing of raw cotton, ELS and to a lesser extent LS have their own special markets. For example, there is no close relationship between Egyptian cotton prices on world markets and international indicators such as the Cotlook A index or the futures prices on the New York Cotton Exchange.

43. Imports of raw cotton into Egypt are presently more than twice the country's exports. Recently, 85 per cent of imports were US "upland" cotton (California/Acala and California/Arizona).

44. The Government has had for many years a policy of raising prices paid to growers in an attempt to raise cotton production and exports.

45. As of 1985, local cotton consumption by mills was a fundamental objective of Government policy every year because domestic mills were considered to be the principal consumer of Egyptian cotton. The Government's objective was to supply the local mills with all their requirements of cotton varieties and grades at the beginning of each cotton season.

46. Domestic mill consumption increased over the years, mainly due to the Government's planning which aimed to expand cotton industry in order to meet home requirements for the large and growing population as well as to increase exports of cotton yarn and textiles. Egypt's mills consumed only 23 per cent of the crop in the 1950s and 53 per cent in the 1970s rising to 66 per cent in 1984/85. Presently, mill consumption is larger than the crop, since imports are greater than exports. Only 5 per cent of the crop was exported as fibre in 1992/93.

47. From 1985, at the beginning of each season, the Ministry of Foreign Trade announced prices to be paid to growers and as well as those for domestic mills and foreign markets as sales prices. Export firms bought cotton from growers, on behalf of the Government and at the announced prices after deducting ginning and interior marketing expenses, and these companies sold cotton lint at the designated prices to local mills and foreign markets. The Government set the price to local mills at the same level as paid to growers. While export sales prices were subject to adjustments through the season in response to a number of considerations, prices to growers were not changed after the announcement of them in order to prevent fluctuations in growers' incomes.

48. Under a new marketing strategy introduced in 1991/92, internal trade is liberalized. The role of the private sector in the production, marketing, ginning and exporting of cotton is to be greatly enhanced and a spot Cotton Exchange is to be opened. An export allocation is to be released whatever the size of the crop or the local mill requirements. The additional needs of local mills for shorter staple cottons are to be met by imports. Export policy and prices are to be announced during September of each year. Export selling prices are to be established at a realistic and competitive price level, keeping the normal differences with other international growths and taking into consideration prevailing world prices. The price differential between ELS and long staple cotton is to be narrowed. Prices paid to growers are to be fixed and announced at an early stage at levels remunerative to the grower and in line with international cotton prices.

2. Mexico

49. Mexico's production of cotton in 1992/93 was only 8.5 per cent of the level in 1980/81 as harvest area fell drastically but was partly offset by a large increase in yield. In the intervening years, wide variations in area and production were closely related to fluctuations in market prices as farmers reacted to prices in one season when making decisions on planting for the next season. Market conditions and prices changed from season to season and this created difficulties when growers had planted a large crop in anticipation of

good prices but were disappointed by what turned out to be low prices when the crop was sold. These experiences have had a negative effect on the country's financing programmes and marketing policies for cotton over the past decade.

50. Mexico's exposure to world market conditions and price levels has intensified since 1985 when, not only was there the traditional link through exports, but the Government lifted controls on the cotton trade and exempted this raw material from the requirement of advance permits to import and export it. Since then, imports have risen to a level equivalent to 15 times exports as production dropped to a very low level and consumption was sustained.

3. Pakistan

51. Cotton production and manufacturing are an important part of the Pakistani economy. Cotton and cotton-based goods account for 60 per cent of the country's earnings.

52. Pakistan's cotton production tripled from 1980/81 to 1992/93, mostly through increases in yields while expansion of area was large too. Through the 1980s and to 1992/93 exports of raw cotton have fluctuated greatly but both production and exports of yarn and fabric increased steadily and greatly.

53. Exports of raw cotton were nationalized in 1973 and the Cotton Export Corporation (CEC) was set up as a public sector enterprise. The CEC eliminated elements of uncertainty previously prevailing in the minds of foreign buyers about assured supplies of desired qualities. Subsequently, the CEC was given further responsibilities of implementing the Government's cotton policy, price support operations to protect interests of growers, ginners, textile mills and all sectors of the trade, and operations of quality improvement, ginning schemes and institutions as well as construction of modern storage facilities.

54. In 1987, the Government partially deregulated the export trade in raw cotton. Whereas previously the export trade was exclusively handled by the CEC, private sector exporters were allowed to participate in exports in competition with CEC. Private exporters were, however, required to purchase stocks from the CEC to meet their export commitments and the CEC remained responsible for the quality of cotton supplied to the private sector. Other changes were a minimum export price set by a committee and later by CEC alone, and registration of all export contracts. Later, the CEC was allowed to sell nearer to the minimum export price in cases of large volume or sales to spinners.

55. The objectives of the partial deregulation of the trade in exports of raw cotton in 1987 were as follows:

- To employ the private sector to help augment the operational capacity for efficiently handling the increasing exportable surpluses;

- To create a healthy competition between the CEC and the private sector for obtaining better prices in the export market;

- To ensure greater participation of the private sector so that exports may not remain confined in a few hands;

- To find new markets/buyers and help diversify exports of cotton.

56. The CEC's role presently is quite distinct from the private sector's roles, as the CEC, in addition to its commercial side in export of raw cotton, is still a Government agency responsible for stabilizing the domestic cotton market and ensuring minimum prices to growers and ginners through its procurement operations besides carrying out Government directives related to cotton policies from time to time. As a result, growers and ginners have received higher than the officially announced minimum prices.

57. The assured price system was introduced in 1976/77 and, since then, the area under cotton has been steadily increasing. Presently, the Government fixes assured minimum prices of seed cotton every year taking account of cost of production, competitiveness of cotton with other crops, viability of the textile industry and world cotton prices. Announcements of assured minimum prices are made before sowing time in order that farmers may consider them when taking decisions on cotton production. Similarly, the price of cotton lint is assured to ginners.

58. Pakistan has had phenomenal growth in textile capacity as measured by numbers of spindles, rotors and looms in both the organized and unorganized sectors as well as in production and exports of yarn and cloth. Exports of cotton yarn increased five-fold from 1980 to 1991 and now equal raw cotton exports by weight and would be much greater than raw cotton in value terms. Exports of cotton fabric more than doubled in the period and now are the equivalent, by weight, of 35 per cent of raw cotton exports but would exceed raw cotton in value terms. Moreover, textile production increased by 48.5 per cent in 1991 and exports by 24.8 per cent in the year.

59. Pakistani fibre is known for its good qualities, particularly strength, but its intrinsic qualities suffer from improper grading and standardization of lint. The country suffers estimated losses of 10 to 20 per cent of the true commercial value of its raw cotton exports because of poor quality control and inability to adequately separate cotton lots according to grade and staple standard. Efforts are being made to alleviate these problems through training and other activities of the Pakistan Cotton Standards Institute.

4. Peru

60. Four varieties of cotton are grown in Peru. The most widespread is Tangüis with a fibre length of 1-3/16 inches. Another is Pima with a staple 1-9/16 inches long and sometimes as long as 1-11/16 inches. A third is Aspero which, despite being a very small part of the crop, is significant as it may be grown in the jungle of San Martín Department (Huallaga area) as a competitive crop which could contribute to the eradication of the cocoa leaves grown there, while Aspero has wide acceptance in Europe and Japan because of its high absorbency. Del Cerro is the fourth variety representing a tiny part of the crop.

61. Two-thirds of the cotton production is Tangüis and a little less than one-third is Pima. As Tangüis is used relatively more by the country's mills, exports of it are a little more than one-third of total cotton fibre exports while Pima accounts for a little more than half. By value, Pima represents almost two-thirds of the total as it commands a higher price than Tangüis.

62. In 1983, cotton trade was liberalized after 8 years of a State monopoly. The economic measures adopted by the then new Government gave hopes for increases

in purchasing power of the population and reactivation of the Peruvian textile industry, and gave an encouraging perspective for the textile industry.

63. By 1991, a free market policy had eliminated controls and export sales registrations for exports of raw cotton. However, both crop production and the textile industry have been affected by economic and financial difficulties and the political situation in the country. Drought accompanying the "El Niño" weather phenomena in the Pacific also reduced yields and output in recent years.

64. For Tangüis, the variety most widely used in the country's textile industry, a procurement timetable makes it possible to assign from the first months of the year, certain volume for export. All Tangüis cotton not committed to domestic users by the beginning of August is released for export. There are no restrictions on exports of extra-long and Aspero fibre.

65. Exports of cotton yarn and fabric in 1987 roughly equalled average exports of raw cotton. Since then growth of the textile industries' exports has been constrained by unfavourable exchange measures and trade barriers of importing countries. In 1987, 38 per cent of Tangüis production was exported as yarn, fabric and ready-made garments, notably to the EEC. The country's textile production from the extra-long fibre and good strength of its Pima cotton permits spinning of yarns of exceptional fineness which can be used with other fibres to make luxury goods such as lingerie, although high quality control and fashion are important factors in this industry.

5. Nigeria

66. After a decline in production, Nigeria's output rose through the 1980s but was outstripped by rapidly growing demand of the country's mills. As a result the country became a significant importer with raw cotton imports presently at about one third of domestic production. The boom in the price of oil in the early 1970s strengthened the country's currency, as an important oil exporter. This was a significant factor which made exports of cotton and other commodities uncompetitive in world markets. Other unfavourable internal factors were labour intensiveness and alternative crops which could be produced more cheaply but obtained higher prices, competition for finance, lack of improved technology and effective extension work and problems of institutionalized marketing.

67. Mill consumption increased with expansion of existing mills and installation of new ones. In 1965, there were only 51 mills and by 1985 there were 135 mills. The large and growing domestic market provided market opportunities for cotton products while there were no exports of yarn or cloth. There may, however, have been exports of ready-made clothing items.

68. The Nigerian Cotton Board was established in 1977 along with Boards for other commodities. In addition to promoting development, providing inputs and other functions, the Nigerian Cotton Board was charged with purchasing, sales and movement of cotton and cotton products to meet domestic requirements and transport to port of shipment of any surplus to such requirements. Funds for the purchase of cotton came from the Central Bank of Nigeria and loans were repaid out of proceeds from sales. Nigeria's Commodity Boards were abolished in the mid-1980s as part of the country's Structural Adjustment Policy.

69. From 1989, the Government has given priority to diversification of the production and export base and making efforts to rehabilitate and expand the non-oil sector in order to deal with the structural problem of large imports of food and intermediate goods which emerged with the oil boom, as well as to expand export earnings and stabilize them. Cotton was considered one such commodity for production and export expansion. Clearly, in the short term, increases in domestic cotton production would save foreign exchange and indirectly ease the structural import problem and foreign exchange crisis. In the long term, it may be possible to have a surplus of cotton to export as lint, yarn, cloth or ready-made apparel items, as the country has a vast agricultural potential.

IV. GENERIC MARKET PROMOTION OF COTTON THROUGH INTERNATIONAL COOPERATION

70. As preferences of consumers are a strong determinant of demand for apparel and other consumer items made of cotton, an avenue to strengthen and expand demand for cotton is through market promotion of articles made of cotton.

71. Promotion efforts may be directed at intermediary levels, such as buyers for stores or distribution chains, in trade fairs and exhibitions, trade missions and specialized trade publications. Efforts may also be aimed at the final consumer as, for example, in general media advertising and publicity or at the merchandising level in store promotion and point-of-sale advertising.

72. In the case of promotion at the level of intermediaries, the goal is to convince them that articles made of cotton are as appealing and otherwise as good or better than competitive items, and therefore will sell as well or better than them. On the other hand, generic promotion addressed to the general pubic and purchasers at point-of-sale is intended to improve the perception of the quality of the product by the consumer.

73. Because of the nature of generic promotion, quantitative assessments of its benefits are difficult to carry out. By all accounts, generic promotion has to be pursued systematically and over a long period of time in order to realize gains. Piecemeal, haphazard or sporadic activities are unlikely to succeed. In any case, promotion and improvement in quality are two of very few avenues which cotton producers can pursue to increase demand.

74. Eight cotton producing countries have supported generic market promotion of pure cotton goods in Western Europe and Japan through the International Institute for Cotton (IIC). National cotton promotion institutions, especially in the United States, have implemented their own generic programmes.

75. IIC was established as an intergovernmental body in 1966 by a group of cotton producing countries which had become alarmed at the erosion of cotton's market share by man-made fibres. Forecasts made at that time showed that cotton would lose market share at an accelerating rate unless action was taken to improve cotton's consumer appeal.

76. IIC has undertaken promotion and advertising at the levels of industry, trade and consumers to ensure that cotton's advantages, its availability and fashion appeal are known. Backstopping these efforts is technical and commercial servicing to extend technical developments and to provide market and creative information such as design, colour and style trends to the industry and trade. IIC did some technical research and development to improve cotton's performance

both in finished textiles and garments and as an industrial raw material. The planning of projects included economic and market research, evaluation of likely benefits and provision of current information for industry, trade and the media.

77. IIC's programmes were concentrated on Western Europe and Japan since these are the principal export markets of common interest to all cotton producers and where competition from man-made fibres and fashion factors are highly important.

78. As a separate area, IIC provided technical extension and commercial training programmes to developing countries to assist the development of their manufacturing bases and their export efficiency.

79. IIC's programmes have been appreciated by governments of cotton producing countries and at all levels of cotton marketing and processing. There seems to be recognition that these programmes contributed to the gains in cotton's market share from the 1960s to the present. Competition between cotton and man-made fibres still remains intense and has spread from developed to developing regions.

80. From the point of view of international cooperation on commodities in general, IIC is one of the few examples of an organization undertaking generic promotion of a commodity. Although a producer organization, IIC received funding from nine consuming developed countries as a form of assistance to developing countries. It has also received substantial practical cooperation at the national level from the industry and marketing organizations. Most of IIC's programmes have had an international component financed by IIC and national inputs from the cooperating national organizations.

81. However, IIC has run into serious financial difficulties in recent years and is in danger of ceasing altogether. Given the economic situation of most of IIC's member countries, it has not been possible for them to increase their contributions. Some developing member countries have withdrawn citing their inability to settle their obligations or questioning the possibility of finding a long term solution to the finance problem. Another concern voiced by IIC members is the "free rider" problem of few contributing while many benefit at no cost.

82. In 1985, IIC put forward an ambitious levy-based plan for financing its operation. The plan received little support from countries which were not members of IIC. IIC has since proposed that informal talks or an international debate should concentrate on how its projects should be funded.

83. As time passes, it is becoming clearer that IIC's work will stop unless a reliable, fair financing mechanism is found soon. Contributions of developed country donors or assistance from the Common Fund, although helpful, are unlikely to provide the major part of funding needed by IIC.

V. RESEARCH AND DEVELOPMENT

84. The major objectives for research on cotton production in developing countries are improved yields, insect and disease resistance, control of insect and other pests by ecologically sound methods, improved farming systems in which cotton is a component, collection and exchange of germ plasm used for breeding new varieties, development of improved fibre quality, and improved harvesting, ginning and packaging.

85. In processing, or "utilization" as it is termed, research objectives centre around improving the aesthetic and performance characteristics of articles containing cotton through modifications in the manufacturing process or in the articles, cost reduction in manufacturing of items containing cotton, development of new products utilizing cotton, improving efficiency of cotton ginning systems and the quality of cotton lint and cottonseed produced, minimizing the problems caused by impurities in cotton lint and development of processing of cottonseed into food for human and non-human consumption.

86. Much work has already been done at the international, regional and national levels on research and development. Yet, needs are enormous. While utilization research has inherent widespread applicability, agricultural research tends to be less so because of varying conditions of pests, diseases, soils, and climate. In both types of research, networking arrangements for execution of projects and programmes have the advantages of making use of existing institutions and are less costly than creation of whole new regional or world research centres. On the other hand, regional or world centres have the great advantage of bringing together specialists on a permanent working basis to consider all problem areas in an integrated approach.

87. Of particular interest at the international level is that the International Cotton Advisory Committee (ICAC) has recently become a sponsoring body for projects on commodity development in connection with the Second Account of the Common Fund for Commodities. These activities are additional to ICAC's main functions of serving as a general forum for deliberation of matters concerning cotton and assessment of the world cotton situation and outlook together with provision of statistical information on the world cotton economy. Among the project proposals and ideas which have been considered in ICAC are: a project on "Research and development of cotton production in the tropics", another for a "Binational Paraguayan-Argentine project for the prevention and control of the cotton boll weevil", and a third for "Environmentally safe integrated pest management for high quality non-sticky cotton".

88. Cotton is a crop normally associated with the fibre produced. However, it is also an important source of oil and meal made from the seed as about two-thirds of the weight of picked cotton is cottonseed. Moreover, the meal is potentially an important source of human food containing 20 per cent protein. A flour of more than 65 per cent protein has been produced from the meal. Exploitation of the meal for human food has been held back by the presence of a substance, gossypol, which is poisonous to man. Although there are technical means to remove it, they so far are too expensive for commercial application. Since world production of cottonseed is about 38 million metric tonnes, if an inexpensive method of removing gossypol could be found, cottonseed could provide a very large source of protein-rich human food which would improve nutrition in developing countries. The increased value of the cottonseed should also add to the value of the cotton crop and thus augment producers' incomes.

VI. PRICE FORMATION

89. Because of the plethora of qualities, origins and destinations, and delivery dates, there is no international exchange where contracts for cotton from many countries are openly traded by a large number of buyers and sellers in competitive conditions. Neither is there systematic collection and dissemination of data on actual transaction prices and quantities which could give transparency to the international market. However, valuable information

on prices and other market news is provided by the weekly "Cotton Outlook", published by Cotlook Ltd. Actual transaction prices are set in contracts that are negotiated between buyers and sellers in the context of their relative strengths, their marketing strategies and the market information that is available to them.

90. In addition to major international cotton traders such as Ralli Bros., Volkart Bros., Dunavant, McFadden/Valmac and Bunge & Born, there are a very large number of small often specialized firms engaged in international trade in cotton.

91. An important price indicator is the "Cotlook A" index published each week in "Cotton Outlook". The "A" index is an average of the prices of the five cheapest of 13 cottons from different countries, all of which are 1-3/32 inches in fibre length. The prices are offering prices quoted by traders for CIF North European delivery. A similar index, "Cotlook B", is published for the less widely traded short staple cottons.

92. Another main price index is the "New York Futures No. 2" price which is the price for trading contracts in a particular cotton (SLM 1-1/16 inch United States grown white cotton) on the New York Cotton Exchange. The New York futures price is important as it gives an idea of the level of cotton prices in the next 17 months since contracts are traded that far ahead in time. The contract is also, of course, the main tool for hedging and speculating operations in cotton.

93. A new "World Cotton Futures Contract" was introduced for trading on the New York Cotton Exchange on 1 October 1992. The primary motivation for the new contract is its potential use by non-US cotton producers and users who are unable to use the New York Futures No. 2 contract to manage price risk when cash prices outside and inside the United States move in different directions or at different rates. The differences in price movements may be due to different perceptions of influences of various market factors, the operation of the United States' cotton policy or changes in transportation cost in world trade. The new contract is based on the Cotlook A index which is denominated in US cents per pound for CIF delivery in Northern Europe.

94. The World Cotton Futures could some day become a new tool for price discovery for non-US cotton. Due to its only recent introduction and light trading so far, it has not yet achieved such a status. Before its introduction, some participants in the futures market estimated that daily trading volume would need to rise to 1,000 contracts and open interest would need to increase to 5,000 contracts to ensure sufficient liquidity and the success of the contract. During the first four months of its trading, the daily volume of contracts traded averaged less than 200 and open interest on 20 January 1993 was only 1,366 contracts. In comparison, daily volume of the long-established No. 2 contract averaged about 6,000 contracts traded and open interest on 20 January 1993 was 43,406 contracts, indicating much more liquidity and depth to the market than for the World Futures contract. Over time, the participants in international cotton trade may become more accustomed to using the contract and its trading volume may rise.